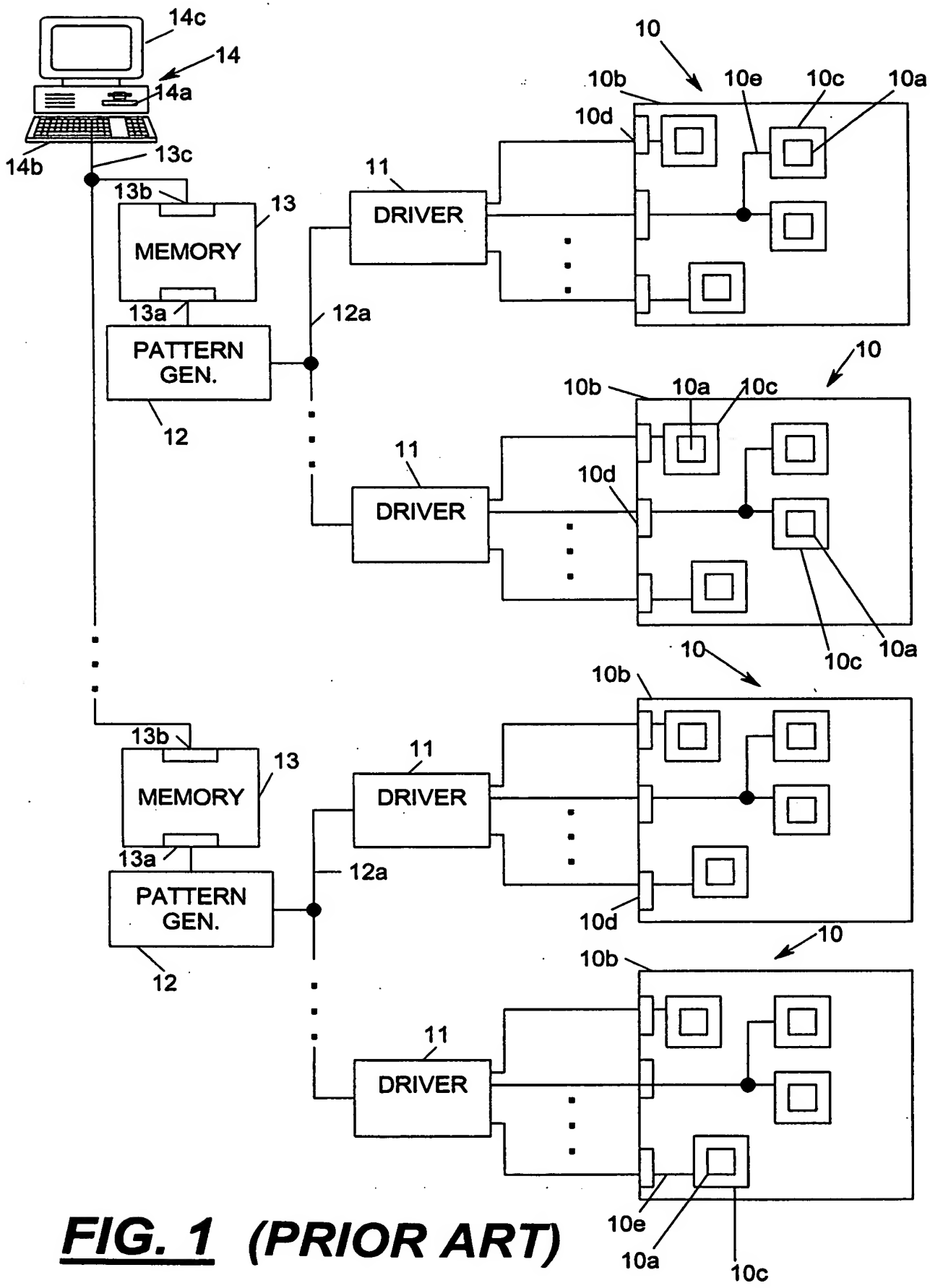


FIG. 1 (PRIOR ART)

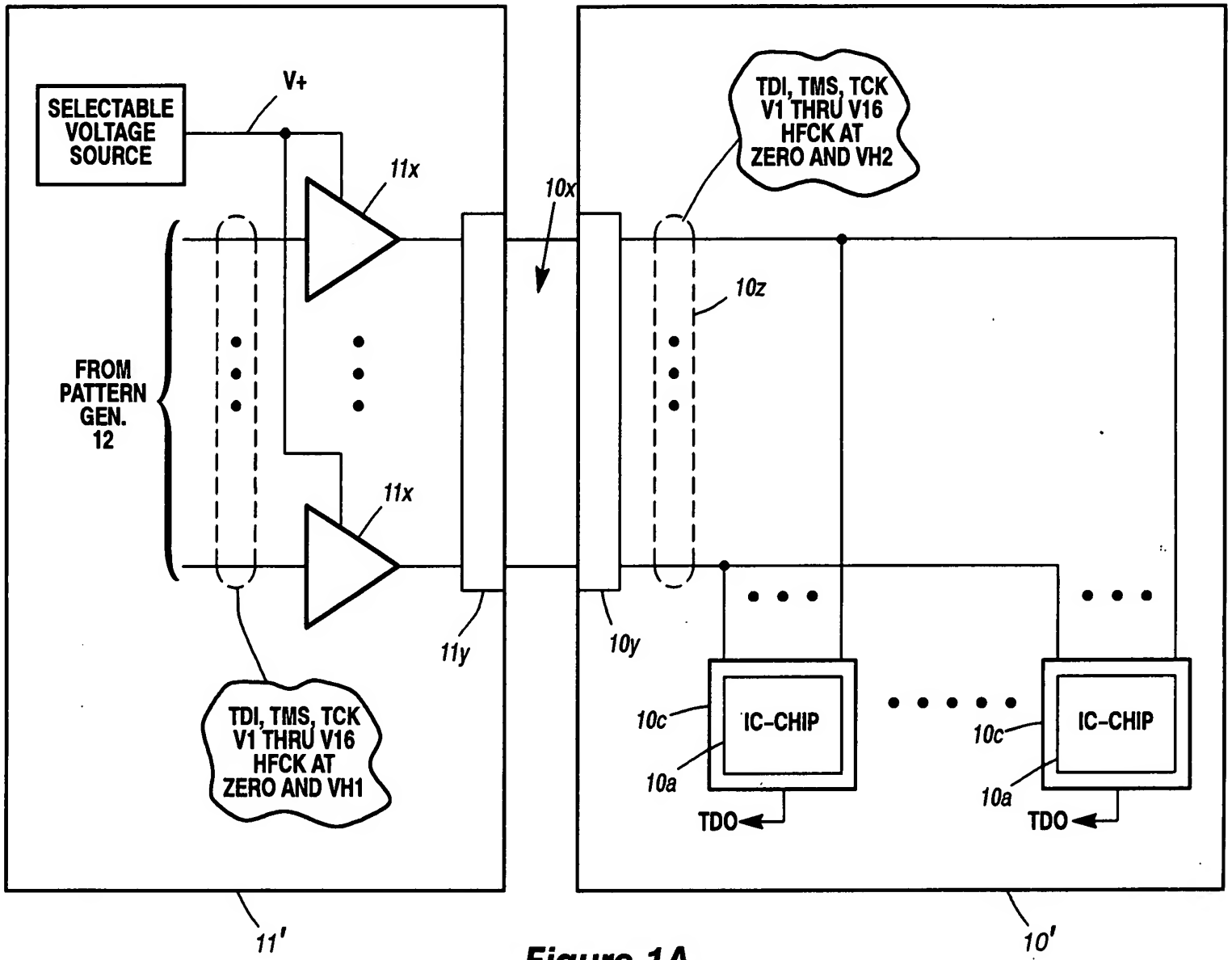
SELECTABLE VOLTAGE SOURCE
V+
11x
11x
FROM PATTERN GEN. 12
11y
TDI, TMS, TCK V1 THRU V16 HFCK AT ZERO AND VH1
11'
10x
TDI, TMS, TCK V1 THRU V16 HFCK AT ZERO AND VH2
10z
10y
10c
IC-CHIP
10a
TDO
10c
IC-CHIP
10a
TDO
10'

Figure 1A

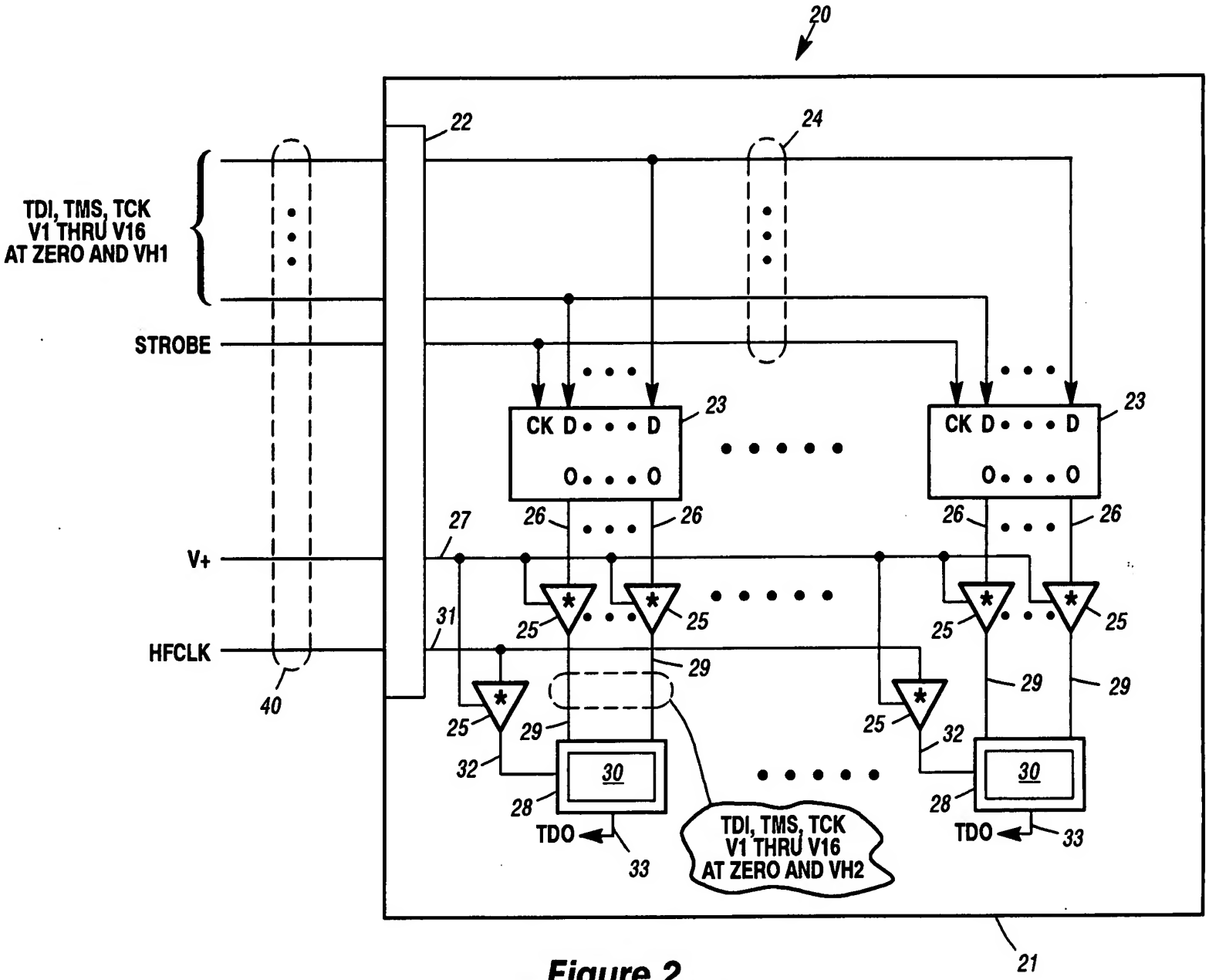
20
22
24
TDI, TMS, TCK
V1 THRU V16
AT ZERO AND VH1
STROBE
V+
HFCLK
40
CK D D
O O
23
26
27
31
25
29
32
30
28
TDO
33
TDI, TMS, TCK
V1 THRU V16
AT ZERO AND VH2
21

**Figure 2**

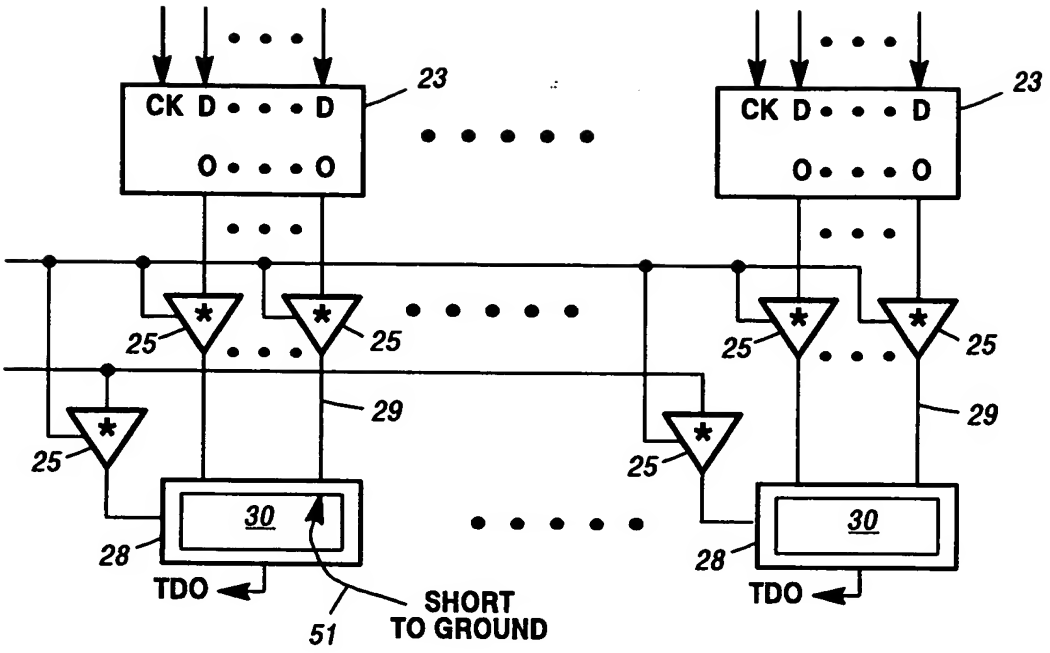


Figure 3A

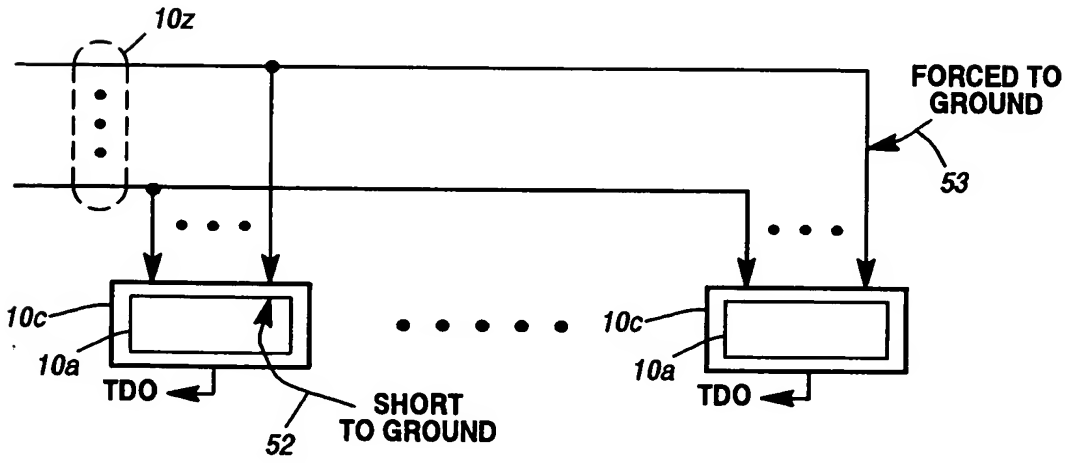


Figure 3B

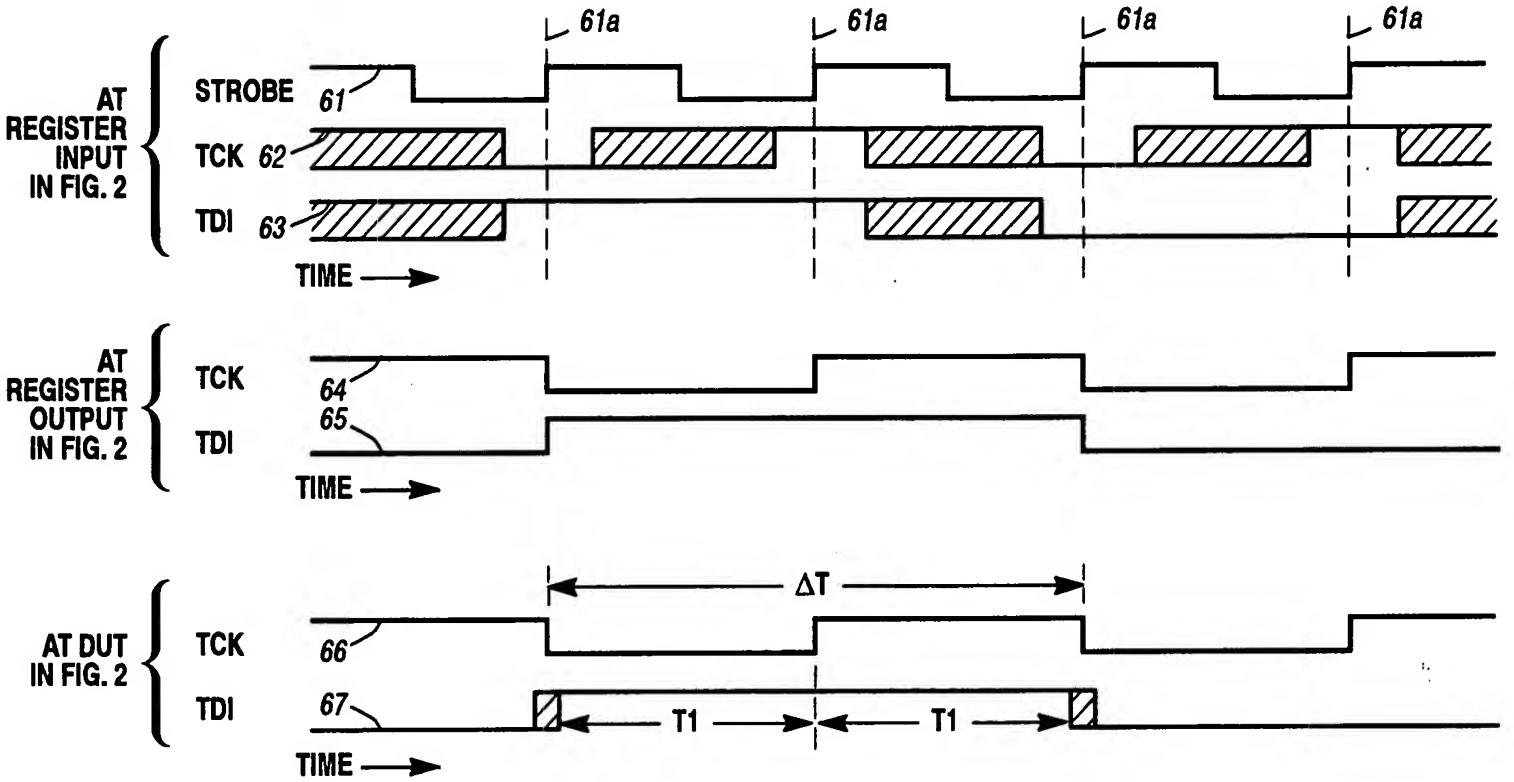


Figure 4A

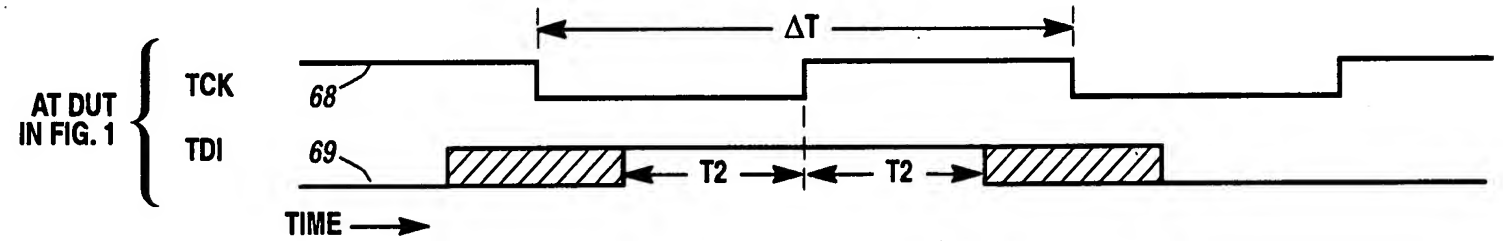


Figure 4B

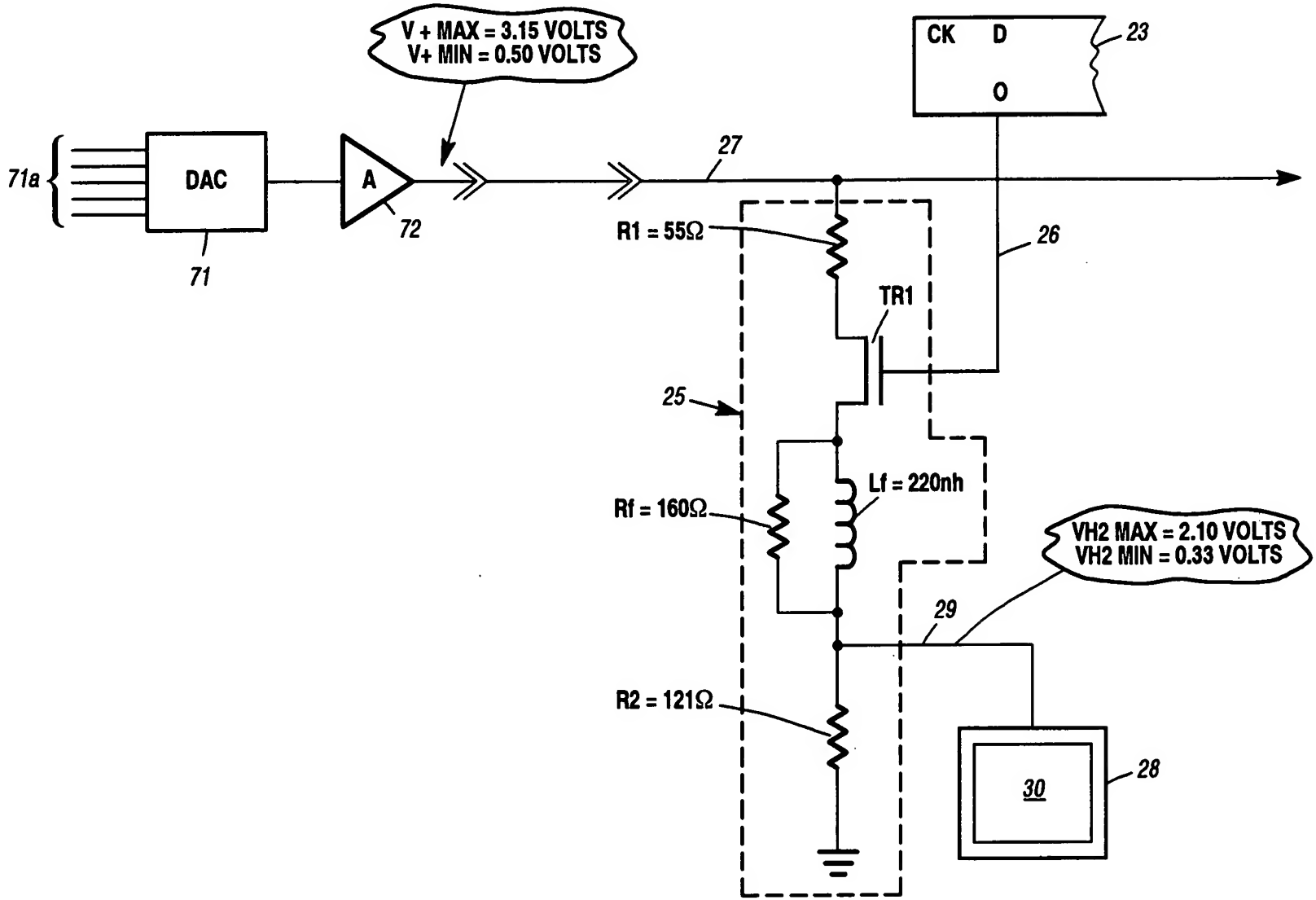
V + MAX = 3.15 VOLTS
V+ MIN = 0.50 VOLTS
CK
D
O
23
71a
DAC
A
72
71
27
R1 = 55Ω
26
TR1
25
Lf = 220nh
Rf = 160Ω
VH2 MAX = 2.10 VOLTS
VH2 MIN = 0.33 VOLTS
29
R2 = 121Ω
30
28

**Figure 5**

Eq. 1 $\sim$MAX POWER = (MAX CURRENT)$^2$(55 + R – ON + 121)

Eq. 2 $\sim$MAX CURRENT = $\dfrac{3.15}{55 + R - ON + 121}$

Eq. 3 $\sim$R – ON = 4.5$\Omega \pm$ 50%

Eq. 4 $\sim$MAX CURRENT = $\dfrac{3.15}{55 + 2.25 + 121}$ = 17.6 ma

Eq. 5 $\sim$MAX POWER = (17.6 ma) $^2$ (55 + 2.25 + 127) = 55.6 mw

Eq. 6 $\sim$Compare: EDGE 692
MIN POWER PER CHIP = 1.5 WATTS
MAX POWER PER CHIP = 3.0 WATTS
TWO TRANSLATORS PER CHIP

Eq. 7 $\sim$0.055 WATTS MAX VS 1.50 WATTS MAX

Eq. 8 $\sim$0.000 WATTS MIN VS 0.75 WATTS MIN

Eq. 9 $\sim$0.027 WATTS AVE VS 1.12 WATTS AVE

***Figure 6***

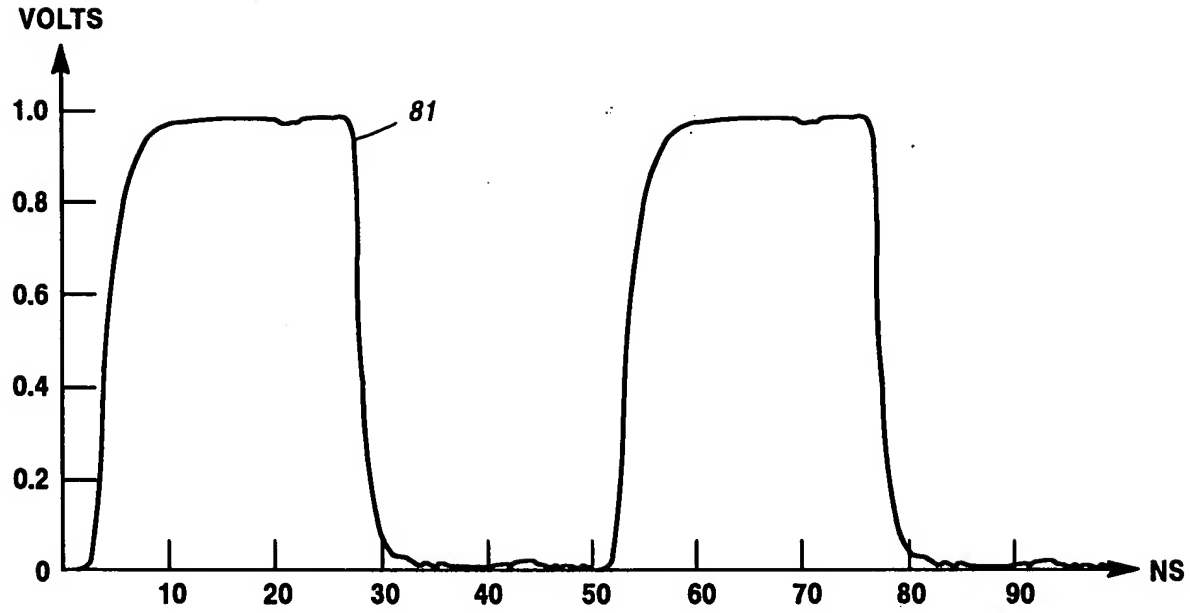


Figure 7A

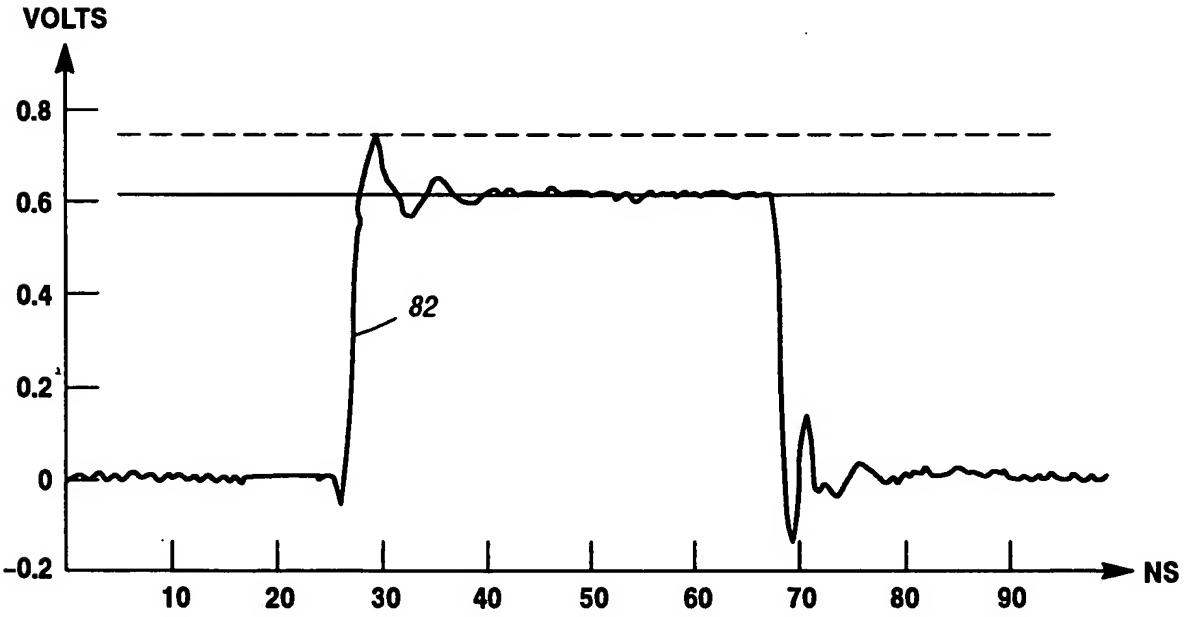


Figure 7B

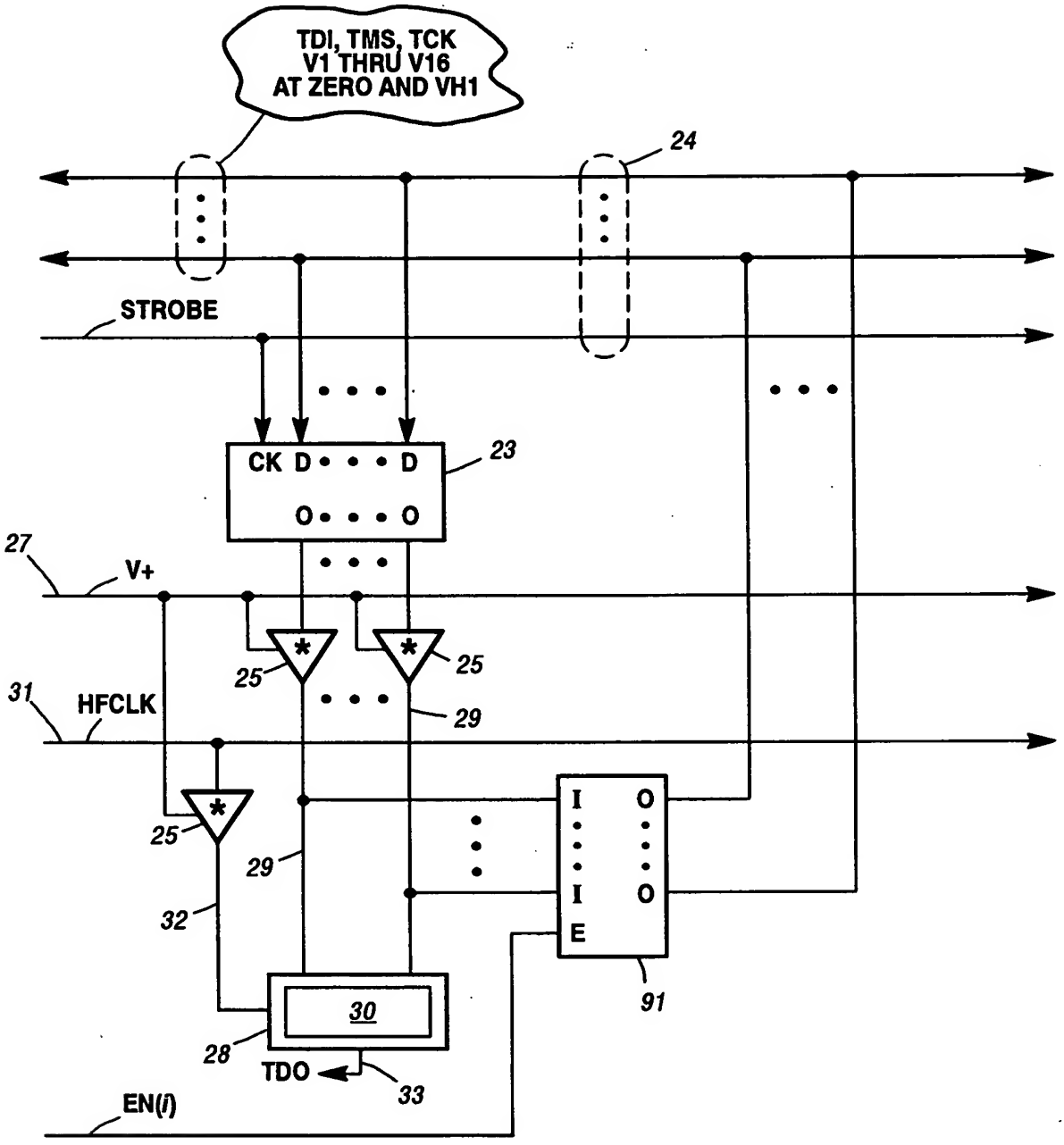
TDI, TMS, TCK
V1 THRU V16
AT ZERO AND VH1
24
STROBE
CK D
D
O
O
23
27
V+
25
25
31
HFCLK
29
25
29
32
I
O
I
O
E
91
30
28
TDO
33
EN(i)

**Figure 8**

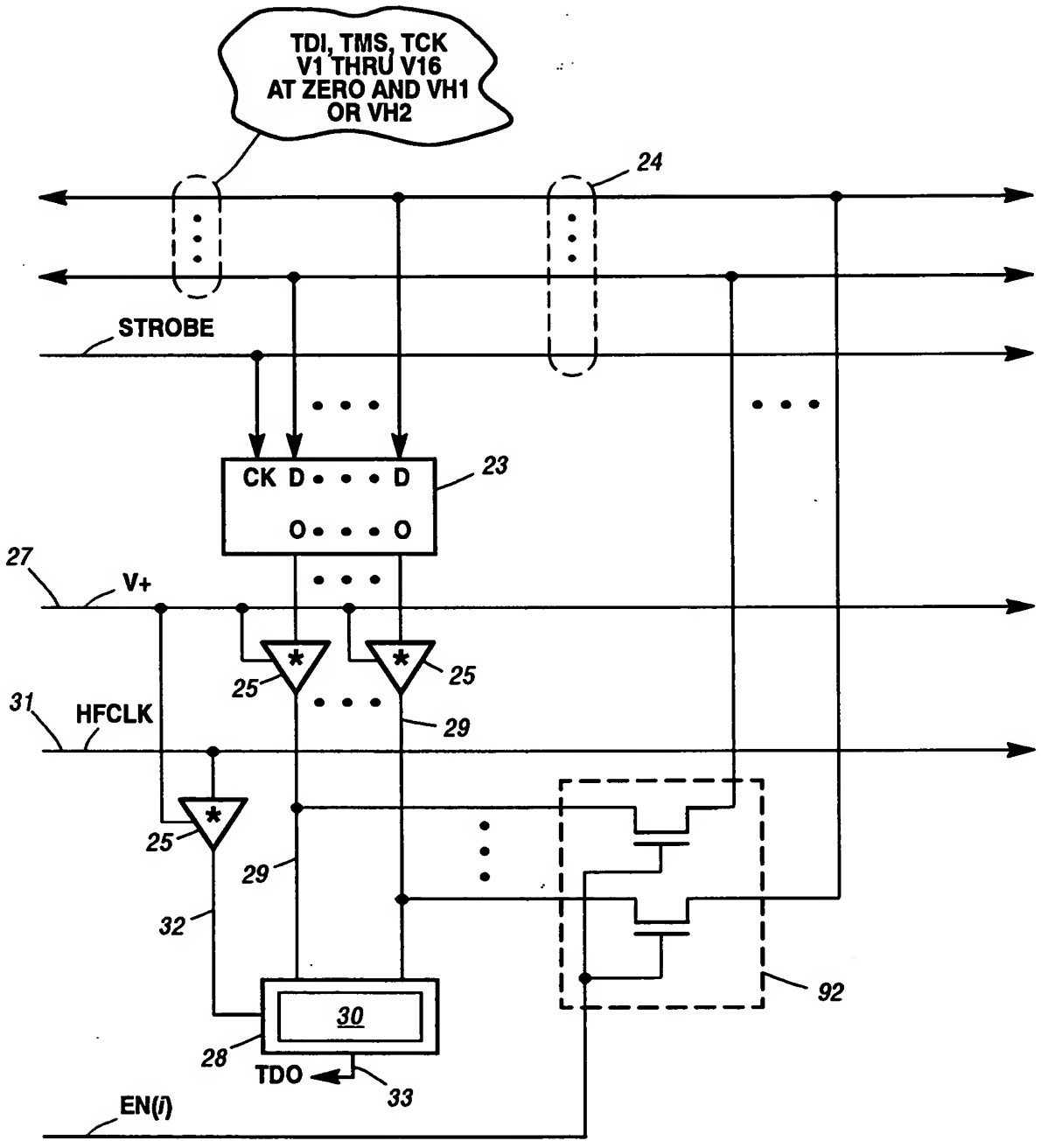
TDI, TMS, TCK
V1 THRU V16
AT ZERO AND VH1
OR VH2
24
STROBE
CK D • • • D
O • • • O
23
27
V+
25
25
31
HFCLK
29
25
29
32
30
28
TDO
33
92
EN(i)

**Figure 9**

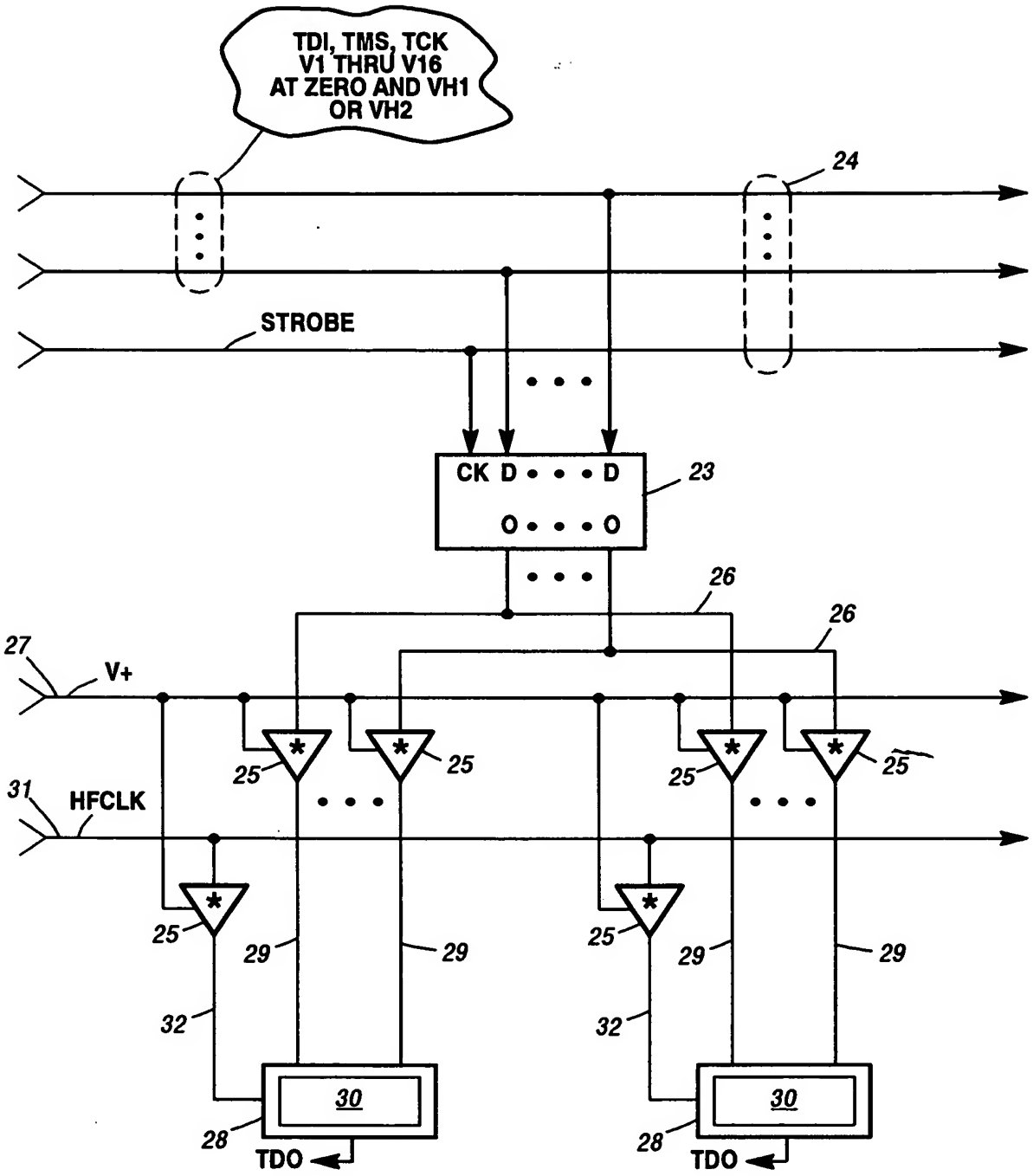
TDI, TMS, TCK
V1 THRU V16
AT ZERO AND VH1
OR VH2
24
STROBE
CK D • • • D
O • • • O
23
26
26
27
V+
31
HFCLK
25
25
25
25
25
25
29
29
29
29
32
32
30
30
28
28
TDO
TDO

**Figure 10**